

REMARKS

Applicants appreciate the thorough examination of the present application in the Office Action of March 29, 2004 (hereinafter "Office Action"). Applicants also appreciate the Examiner's indication that Claims 5-14, 18-27, 29, 32-34, and 37-42 would be allowable if rewritten independent form. Applicants respectfully traverse the rejections of the remaining claims for at least the reasons discussed below.

Independent Claim 1 is patentable over the cited references

Independent Claim 1 stands rejected under 35 USC § 103(a) as being unpatentable over U.S. Patent No. 5,987,074 to Wakamatsu (hereinafter "Wakamatsu") in view of U.S. Patent No. 5,734,639 to Bustamante et al. (hereinafter "Bustamante"). Applicants respectfully traverse these rejections, as the combination of Wakamatsu and Bustamante fails to disclose several of the different recitations of Claim 1.

Independent Claim 1 recites:

A joint demodulation system for demodulating jointly received first and second signals, the joint demodulation system comprising:
a converter that is configured to downconvert the jointly received first and second signals; and
a joint demodulator that is responsive to the downconverted jointly received first and second signals, and that is configured to separately generate an estimated first frequency/first frequency error for the downconverted first signal and an estimated second frequency/second frequency error for the downconverted second signal;
wherein the converter is responsive to the estimated first frequency/first frequency error to downconvert the jointly received first and second signals; and
wherein the joint demodulator is responsive to a difference between the estimated second frequency/second frequency error and the estimated first frequency/first frequency error to jointly demodulate the downconverted jointly received first and second signals. (*Emphasis added*).

In rejecting Claim 1, the Office Action asserts that the converter 2 shown in FIG. 1 of Wakamatsu corresponds to the converter of Claim 1. Office Action, p. 3. However, the converter 2 of Wakamatsu does not appear to downconvert *responsive to* the estimated first frequency/first frequency error. In particular, as illustrated in FIG. 1 of Wakamatsu, the converter 2 appears to have only one input, which is from the antenna 1. *See* Wakamatsu, FIG. 1. As such, the converter 2 appears to be responsive to the received signal from the antenna 1, but not to an estimated frequency/frequency error. Accordingly, Wakamatsu does

not teach or suggest a converter that is "responsive to the estimated first frequency/first frequency error," as recited by Claim 1.

The Office Action further asserts that the demodulator 43 is responsive to a difference between the estimated second frequency/second frequency error and the estimated first frequency/first frequency error. Office Action, p. 3. However, as shown in FIG. 1, the only inputs to the QPSK demodulation circuit 43 of Wakamatsu appear to be the signals from low-pass filters 11 and 12. *See* Wakamatsu, FIG. 1. As described by Wakamatsu with reference to FIG.1, "[t]he QPSK demodulation circuit 43 demodulates each of the Q [quadrature-phase] and I [in-phase] signal components". *See* Wakamatsu, Col. 3, lines 17-19. In other words, only the in-phase and quadrature-phase components of the received signal appear to be input to the demodulator 43. Thus, the demodulator 43 appears to be responsive to the components of the received signal, but does not appear to be *responsive to a difference* between an estimated first and second frequency/frequency error. In fact, as described by Wakamatsu, "[t]he QPSK demodulation circuit 43 detects a frequency error of the input signal from the normal signal and generates an AFC signal for correcting the error." *See* Wakamatsu, Col. 4, lines 61-63 (*Emphasis added*). In other words, only one frequency/frequency error appears to be estimated by the demodulator 43 of Wakamatsu. As such, *a difference* between a first and second frequency/frequency error does not appear to be disclosed by Wakamatsu. Accordingly, Wakamatsu does not teach or suggest a joint demodulator that is "responsive to a difference between the estimated second frequency/second frequency error and the estimated first frequency/first frequency error," as recited by Claim 1.

Moreover, Bustamante does not appear to supply the missing recitations. The Office Action relies on Bustamante only for disclosing downconverting multiple received signals. Office Action, p. 3. As such, the combination of Bustamante and Wakamatsu does not disclose or suggest all of the recitations of Claim 1.

Further, the Office Action provides insufficient evidence from the prior art to combine the teachings of Wakamatsu with those of Bustamante. Applicants submit that, to support combining references, evidence of a suggestion, teaching, or motivation to combine must be *clear and particular*, and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). In attempting to support the combination of Wakamatsu and Bustamante, the Office Action provides only a conclusory assertion that it

would be obvious to combine Wakamatsu and Bustamante "for improving the communication system." Office Action, p. 3. However, such an assertion provides no evidence from the prior art as to why or how combining the teachings of Wakamatsu and Bustamante would "improve the communication system." Accordingly, Applicants submit that this stated motivation to combine Wakamatsu and Bustamante is not "clear and particular," and as such, is insufficient to support a rejection under §103.

In light of at least the foregoing reasons, it is clear that the combination of Wakamatsu and Bustamante fails to disclose or suggest several recitations of independent Claim 1. Accordingly, Applicants submit that independent Claim 1 is patentable over Wakamatsu and Bustamante. Applicants further submit that dependent Claims 2-4 are patentable at least by virtue of depending from patentable independent Claim 1. In addition, independent Claim 35 is a method analog of Claim 1, and is thus patentable for at least the same reasons as described above. Dependent Claim 36 is also thus patentable at least by virtue of depending from patentable independent Claim 35.

Furthermore, Independent Claim 15, although not identical to Claim 1, also recites a joint demodulator that is *responsive to* the estimated second frequency/second frequency error and the estimated first frequency/first frequency error. As noted above, the joint demodulator 43 of Wakamatsu appears to be responsive to only the components of the received signal. Accordingly, Applicants submit that independent Claim 15 is patentable for many of the same reasons described above with reference to Claim 1. Dependent Claim 16 is also patentable at least by virtue of depending from patentable independent Claim 15. In addition, independent Claim 43 is a method analog of Claim 15, and is thus patentable for the at least the same reasons as described above. Similarly, dependent Claim 44 is patentable at least by virtue of depending from patentable independent Claim 43.

Independent Claim 28 is patentable over the cited references

Independent Claim 28 also stands rejected under 35 USC § 103(a) as being unpatentable over Wakamatsu in view of Bustamante. Applicants respectfully traverse these rejections, as the combination of Wakamatsu and Bustamante fails to disclose several of the different recitations of Claim 28.

Independent Claim 28 recites:

A demodulation system for jointly received first and second signals, comprising:

a joint demodulator that is configured to generate an estimated first frequency/first frequency error for the first signal and an estimated second frequency/second frequency error for the second signal;

a first long term automatic frequency control that is responsive to the estimated first frequency/first frequency error, wherein the joint demodulator is responsive to the first long term automatic frequency control; and

a second long term automatic frequency control that is responsive to the estimated second frequency/second frequency error, wherein the joint demodulator is responsive to the second long term automatic frequency control. (*Emphasis added*).

In rejecting Claim 28, the Office Action asserts that the automatic frequency control (AFC) circuit 44 shown in FIG. 1 of Wakamatsu corresponds to the one of the automatic frequency controls of Claim 1. Office Action, p. 5. However, Wakamatsu's AFC circuit 44 does not appear to be *responsive to* a first frequency/first frequency error or a second frequency/second frequency error. In particular, as described by Wakamatsu, "[t]he QPSK demodulation circuit 43 incorporates an automatic frequency control (AFC) circuit 44 which detects the difference between the frequency of the signal received by the tuner 3 and the receiving frequency designated by the host CPU 8, and which outputs a signal corresponding to the difference". See Wakamatsu, Col. 3, lines 22-27 (*Emphasis added*). In other words, the estimated frequency error appears to be the *output* of the AFC 44. However, as shown in FIG. 1, the frequency error output from the AFC 44 does not appear to be input back into the AFC 44 or into any other AFC. As such, the AFC circuit 44 of Wakamatsu does not appear to be responsive to the estimated frequency error. Accordingly, Wakamatsu does not teach or suggest an automatic frequency control that is "responsive to the estimated first frequency/first frequency error" or "the estimated second frequency/second frequency error," as recited by Claim 28.

The Office Action further asserts that, although Wakamatsu does not disclose two AFCs, it would have been obvious to modify Wakamatsu to include a separate second automatic frequency control "for improving the communications system." Office Action, p. 5. However, as discussed above with reference to Claim 1, such a conclusory assertion is not "clear and particular," as required by the cited case law. For example, such an assertion offers no evidence from the prior art as to why or how the addition of a second automatic frequency control would "improve the communication system." Accordingly, that the stated motivation to modify Wakamatsu is insufficient to support a rejection under §103.

In light of at least the foregoing reasons, it is clear that Wakamatsu fails to disclose or suggest several recitations of independent Claim 28. Further, the Office Action does not rely

on Bustamante to supply the missing recitations. Accordingly, Applicants submit that independent Claim 28 is patentable over the combination of Wakamatsu and Bustamante. Applicants further submit that dependent Claims 30 and 31 are patentable at least by virtue of depending from patentable independent Claim 28.

The dependent claims are separately patentable

Applicants submit that dependent Claims 2-4, 16-17, 30, 31, 36, and 44 are patentable at least by virtue of depending from various ones of patentable independent Claims 1, 15, 28, 35, and 43. Applicants further submit that many of the dependent claims have independent bases for patentability.

For example, Claim 4 recites:

The system according to Claim 1 further comprising:

a first feedback loop that is ***coupled between the estimated first frequency/first frequency error and the converter***, such that the converter downconverts the jointly received first and second signals ***based on the estimated first frequency/first frequency error***; and

a second feedback loop that is coupled between the estimated second frequency/frequency error and the joint demodulator, such that the joint demodulator separately generates the estimated first and second frequency errors ***based on the estimated second frequency/second frequency error***. (*Emphasis added*).

The Office Action asserts that Wakamatsu discloses a first feedback loop (blocks 51, 52, 53, 30, 27, 28, 29) that corresponds to the recitations of Claim 4. Office Action, p. 4. However, Applicants submit that the feedback loop of Wakamatsu does not appear to be ***coupled*** between the first frequency/first frequency error and the converter, and that the converter does not appear to downconvert ***based on*** the first frequency/first frequency error. As discussed above with reference to Claim 1, the converter **2** of Wakamatsu appears to have only one input, which is from the antenna **1**. See Wakamatsu, FIG. 1. Further, the converter **2** appears to have only one output as well, to the automatic gain control (AGC) circuit **22**. As such, the converter **2** does not appear to also be coupled to a first frequency/first frequency error via the first feedback loop. Similarly, the converter **2** does not appear to downconvert based on the first frequency/first frequency error, as it appears to downconvert based on only the received signal from the antenna **1**.

The Office Action likewise asserts that Wakamatsu discloses a demodulator (43) that corresponds to the recitations of Claim 4. Office Action, p. 4. However, Applicants submit that the joint demodulator of Wakamatsu does not appear to generate the first and second

frequency errors **based on** the second frequency/second frequency error. As discussed above with reference to Claim 1, the only inputs to the QPSK demodulation circuit **43** of Wakamatsu appear to be the signals from low-pass filters **11** and **12**, which are the in-phase and quadrature-phase components of the received signal. *See* Wakamatsu, FIG. 1. As such, the demodulator **43** of Wakamatsu does not appear to demodulate based on the second frequency/second frequency error, as it appears to demodulate based on only the components of the received signal.

Accordingly, Wakamatsu does not disclose or suggest all of the recitations of Claim 4, and the Office Action does not rely on Bustamante to supply the missing recitations. As such, Claim 4 is independently patentable over the combination of Wakamatsu and Bustamante.

In addition, Claim 16, although not identical to Claim 4, also recites a joint demodulator that demodulates **based on** estimates of a first frequency/first frequency error **and** a second frequency/second frequency error. As noted above with reference to Claim 4, the output of the joint demodulator **43** of Wakamatsu appears to be based on only the components of the received signal. Further, as discussed above with reference to Claim 1, only one frequency/frequency error appears to be estimated by the demodulator **43**. As such, Wakamatsu does not appear to disclose a joint demodulator that demodulates "based on the estimate of a first frequency/first frequency error; and...based on the estimate of the second frequency/second frequency error," as recited by Claim 16. Accordingly, Applicants submit that Claim 16 is independently patentable over the combination of Wakamatsu and Bustamante.

Claims 2 and 3 are also separately patentable over Wakamatsu and Bustamante. For example, Claim 2 recites, in part, "the joint demodulator assumes there is no first frequency error." Also, Claim 3 recites, in part, "the first signal is a desired signal and...the second signal is an interfering signal." In rejecting Claims 2 and 3, the Office Action concedes that the combination of Wakamatsu and Bustamante fails to disclose or suggest the above recitations. Office Action, pp. 3-4. However, in each case, the Office Action asserts that "one can easily assume" the above recitations, and as such, it would have been obvious to so modify Wakamatsu and Bustamante "for improving the communication system." Office Action, pp. 3-4. Applicants submit that the Office Action's conclusory assertions that "one can easily assume" and "for improving the communication system" do not provide clear and

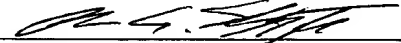
particular motivation to modify the cited references, as discussed above. For example, such vague assertions present no evidence from the prior art as to why or how the lack of a first frequency error and/or the use of desired and interfering signals could be "easily assumed," or why or how such features would "improve the communication system." Accordingly, as the stated motivation for modification is insufficient, Claims 2 and 3 are independently patentable over the combination of Wakamatsu and Bustamante.

Claim 30 is separately patentable as well. Claim 30 recites, in part, "the converter also is responsive to the first long term automatic frequency control." However, as discussed above, the converter 2 of Wakamatsu appears to be responsive to the received signal from the antenna 1, but does not appear to be responsive to the automatic frequency control 44. *See* Wakamatsu, FIG. 1. Accordingly, Wakamatsu does not teach or suggest all of the recitations of Claim 30. Nor does Bustamante appear to supply the missing recitations. Despite this, the Office Action again asserts that it would have been obvious to combine Wakamatsu and Bustamante "for improving the communication system," which, as discussed above, is insufficient motivation for the combination. As such, Claim 30 is independently patentable over the combination of Wakamatsu and Bustamante.

CONCLUSION

Applicants again thank the Examiner for the thorough examination and the indication of allowable claims. However, based on the analysis above, Applicants respectfully submit that the remaining claims are also in condition for allowance. Accordingly, Applicants respectfully request allowance of all pending Claims 1-44 and passing the application to issue.

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